Comprehensive Analysis and Recommendations for the Town of Enfield, Connecticut Emergency Medical Service System

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CHAPTER I EXECUTIVE SUMMARY

The Town of Enfield is currently served by a dedicated group of public safety professionals in the police department, fire departments, and a private commercial ambulance service who are committed to providing the highest level of service to the public.

The system has many components that work effectively at times, but the individual public safety agencies and commercial ambulance service are not currently integrated into an effective EMS system. Additionally, there is lack of consistency with first response medical coverage from fire departments due to manpower shortages or inadequately staffed "chase" cars. Two medical emergencies of the exact same nature, at the same address, only hours apart would probably elicit a different emergency response of resources and medical providers. One common theme heard by the Consultant in interviews with system participants was that citizens complain of too many resources showing up at a scene when it is not necessary. The response of too many resources to one scene, instead of sending the appropriate amount of resources, invites a risk management scenario which could result in a serious injury or death of a care provider(s) or an innocent bystander(s) as a result of a traffic accident. In summary, there is a lack of continuity, accountability, and uniformity within the system.

Today, when the Town of Enfield is compared to the national standards and benchmarks, there appears to be a number of opportunities for system improvements and enhancements.

Recommendation #1: *Key to the opportunity to improve the delivery of emergency medical care in the Town of Enfield should be the transition of the system to a public consortium EMS model. This public consortium EMS model should develop in two phases. Phase I would consist of initially providing basic life support transport, while preparing in Phase II to transition to delivering advanced life support services and transport.*

A public consortium EMS model is ideal when multiple agencies from various disciplines are integrated into the mission of providing emergency medical service care and delivery to a specific community. A public consortium EMS model is operated as a government agency which coordinates and oversees the EMS system. The public consortium EMS model owns and purchases all the equipment, ambulances, and medical supplies, while contracting out the human resource component on a performance basis.

Recommendation #2: *The Town Council should appoint an EMS Advisory Commission which would provide recommendations, help to establish policy, and provide direction for the provision of emergency medical services throughout the entire Town of Enfield. The establishment of an EMS Advisory Commission should be done in a manner consistent with Connecticut state laws and the Town Charter.*

Recommendation #3: *The EMS Advisory Commission should be a seven member group consisting of a town official, a council member, the police chief, a member of the Enfield Fire Chief's Association, a representative of Johnson Memorial Hospital, a representative from the John Maciolek American Legion Post 154, and a citizen in the community familiar with EMS systems.*

The primary responsibility of the EMS Advisory Commission is to make recommendations and establish policy direction which provides the highest quality of patient care and services available, always ensure state of the art equipment, provide such services in the most fiscally responsible and efficient manner, and creates a seamless EMS system for all citizens in the community.

Recommendation #4: *A full-time EMS Director should be hired to manage the day-to-day operations, administration, logistics, and coordination of the six public safety agencies and one private ambulance company with respect to the EMS system. The EMS Director would be a Town of Enfield employee.*

Recommendation #5: *The public consortium EMS model in Enfield should enter into financial and performance contracts with the various fire departments to provide the human resources to deliver emergency medical care, using the equipment, ambulances, and supplies provided by and owned by the public consortium EMS model. The contracts entered into with the fire departments should stipulate certain criteria, such as manning of vehicles, times of deployment, response times, etc.*

Attributes of the system should include:

- Provide the highest quality of patient care where a "patient comes first" attitude must prevail as the priority with the EMS Advisory Commission, administrators and care providers.

- Services are provided by contractors (fire departments) who are under "performance-based" agreements. These types of arrangements which require results must be achieved using the creativity and innovative methods of the providers.

- Sound business financial controls must be in place where the appointed oversight agency controls all system funding. The system should be designed to be funded through the collection of user fees, donations, and other sources of revenue, and with as little reliance as possible on tax dollars.

With the transition to a public consortium EMS model, higher levels of service and care can be realized through coordination of the main components of an EMS system. Opportunities for standardization of first response and EMS transport can be accomplished in the areas of management, training, medical equipment, continuity of care, administration, standard operating procedures, rules and regulations.

Recommendation#6: *Implementation of this system should occur as soon as possible in order to reduce morbidity and mortality in the Town of Enfield.*

Enfield Model

In the public consortium EMS model envisioned in the Town of the Enfield, the police department would provide a comprehensive level of service with the communications and first response component. The various fire departments in the community would provide an all-encompassing level of basic life support service in Phase I while preparing for Phase II (advanced life support treatment and transport) administratively, financially, logistically, and legally in accordance with State of Connecticut regulations 19a-180-1. - 19a-180-10.

Recommendation#7: *Preparation for Phase II should begin as soon as possible, outlining time tables for various components or cooperating with Johnson Memorial Hospital when a paramedic program is initiated by the hospital.. This is especially true if the fire departments within the Town plan on training in-house personnel as paramedics. The fire departments should give priority to volunteer personnel already familiar with the system. However, as a "fail-safe," consideration may have to be given to hiring individuals already licensed as paramedics in the State of Connecticut.*

The new national curriculum due to be implemented in 2001 for paramedics is designed to be a two-year program. With the move to a two-year program, the cost of training and educating a paramedic will rise - thus increasing educational costs to the system and delaying implementation of Phase II.

Recommendation #8: *Continue to have American Medical Response (AMR) provide advanced life support services for Town until Phase II operation begins.*

The first component on each and every emergency medical call in the Town of Enfield would be for the police communications center to objectively evaluate each 911 caller's request for medical assistance. Through an objective call screening process, determine the exact nature of the emergency, send the right and appropriate amount of resources, and provide pre-arrival instructions to the caller, if necessary.

The second component on every life-threatening emergency medical call in the Town of Enfield would be for the police department to respond to all life-threatening emergencies with EMT-trained police officers.
Recommendation #9: *Equip all Enfield police vehicles with appropriate basic life support equipment and an automatic external defibrillator (AEDs) while maintaining the current medical licensure of police officers at the EMT level.*

The use of AEDs among first responders has become a standard of practice nationwide. Given the relative low-cost of AEDs and their ease of use, the standard of care among first responders is to carry and use an AED when indicated. Not carrying and using an AED would probably expose the Town of Enfield to possible civil litigation, with a plaintiff contending the Town has not met the standard of care with respect to the application of AEDs in sudden deaths.

The third component on medical calls in the Town of Enfield would be for the various fire departments to staff various BLS and eventually ALS vehicles and/or ambulances.

When all three components are integrated into an “EMS system,” a model develops which creates a “chain of survival” for any medical emergency in the Town of Enfield.

In conclusion, there is an opportunity to significantly increase the level of emergency medical service care to the citizens of the Town of Enfield by transforming the delivery of care to a public consortium EMS model.

CHAPTER II INTRODUCTION

Emergency Medical Services (EMS) are essential to the public safety and health of the general public. In order to provide implementable strategies for the Town of Enfield, a detailed scope of work was established for this project resulting in specific recommendations. The scope of the study includes the following items:

- Analysis of the existing system in the Town of Enfield with a comprehensive description of the roles of various participants.

- Development of minimum performance standards which should be implemented in a high quality EMS system.

- The preparation of specific recommendations to improve and enhance the current EMS system in the areas of efficiency, effectiveness, quality, and long-term stability. The recommendations are structured to support evolutionary improvements to the system with continuous strengthening of the system’s stability. The proposed activities prepare the system to respond effectively to changes with respect to its strengths, opportunities, weaknesses, and threats.

The forthcoming recommendations were established with specific goals in mind. The goals are:

Improve patient care.

Provide consistency in patient care and performance of all EMS system participants.

Increase efficiency and effectiveness of the system.

Improve financial stability of the system by maximizing the use of resources while improving efficiency and economy.

Interviews, studies, and discussions were conducted with the following participants:

1. Town of Enfield Officials

2. Enfield Police Department Administration

3. Enfield Police Department Communications

4. Enfield Fire Department Chief

5. Representatives from the John Maciolek American Legion Post 154

6. Thompsonville Fire Department Chief and Assistant Chief

7. North Thompsonville Fire Department Assistant Chief and Captain

8. Hazardville Fire Department Chief

9. Shaker Pines Fire Department Chief

10. Johnson Memorial Hospital Medical Director and EMS Coordinator

11. Enfield Fire Department IAFF Union Local - Union President

12. Thompsonville Fire Department IAFF Union Local - Union President

13. Enfield Police Department - Union President

14. American Medical Response - General Manager

15. First Responders

16. Career Fire Fighters

17. Volunteer Fire Fighters

18. Police Officers

19. Dispatchers

Key to the success of this study was the willingness of all the participants to provide input into the process. The Ludwig Group, LLC would like to thank all those who took their time to discuss EMS issues and provide information for the study. We were impressed with the level of interest, awareness, and commitment to the EMS system by some of the stakeholders.

CHAPTER III BACKGROUND

The structure of the EMS system in the Town of Enfield has incrementally evolved since 1950, rather than developed through a planned process. This has resulted in some fragmentation, some uncoordination of the three main providers (police, fire, private ambulance), and several ancillary providers, funded by a civic-minded organization, operating with limited oversight, coordination, and control as a system.

The current model for the Town of Enfield is a patchwork with the Enfield Police Department as the main provider. A police officer who is a licensed EMT is dispatched to all medical calls and performs as a first responder. If necessary, a police officer may have to transport a patient to the hospital using an Enfield Community ambulance. American Medical Response (AMR), with no contract, provides advanced life support services to the Town. An AMR ambulance, if available, and/or an Enfield Community ambulance is dispatched to every scene. One Enfield Community ambulance is housed 24 hours, 7 days a week at the Thompsonville Fire Department and is dispatched to all calls within their fire district. If the ambulance is dispatched outside their district, the fire fighter transports the ambulance to the scene and drops it off for other care providers to use. The other Enfield Community ambulance is housed on a rotation basis among three fire departments (Enfield, North Thompsonville, Hazardville) from 0800 hours until 1700 hours from Monday through Friday. The remaining time, the ambulance is housed at the Enfield Public Safety Complex and must be picked up by a police officer and transported to a scene. Both Enfield Community ambulances are only basic life support capable. Enfield, North Thompsonville, and Hazardville fire departments also operate "chase" cars which respond to the scene, stabilize the patient, and if necessary, will assist a police officer transporting a patient to the hospital. (The Shaker Pines Fire Department has chosen not to house the ambulance; nor have "chase" cars. However, it is anticipated that shortly an AED may be placed on the apparatus). At times, it is necessary for AMR to send a basic life support ambulance. Additionally, the Town of Enfield will utilize EMS mutual aid from surrounding communities. Finally, on rare occasions, a medical helicopter from Hartford, Connecticut is requested to respond into the Town.

There is no committed budget for emergency medical services in the Town of Enfield. There are some indirect funds which support the system, such as an EMT stipend for police officers. The primary source of funding for the EMS system in Enfield comes from the John Maciolek American Legion Post 154. The Maciolek Post initiated the Enfield Community Ambulance in 1950, staffing, maintaining, and operating the ambulance until approximately 1955 when those duties were handed over to the Enfield Police Department. In approximately 1975, the police starting staffing paramedics on the ambulances. The Maciolek Post, primarily through fund raising, continues to be the primary financing source for the EMS program.

The Town of Enfield is 33.8 square miles and operates under a Council-Manager form of government. The 1990 census determined that the population of the Town was 45,547. Enfield, located in north central Connecticut, is eight miles south of Springfield, Massachusetts and fifteen miles north of Hartford, Connecticut.

There are six main public safety agencies in the Town of Enfield - one police department, five fire departments and one private commercial ambulance service. The five fire departments are; Enfield Fire Department; Thompsonville Fire Department, Hazardville Fire Department; North Thompsonville Fire Department, and Shaker Pines Fire Department.

The private commercial ambulance company, American Medical Response (AMR) provides advanced life support in the Town. In 2000, AMR transported 1,735 patients in the Town of Enfield and was unavailable over 241 times when contacted for service. In the interview conducted with the General Manager of AMR, he indicated the 241 number was not accurate and in a letter later sent, indicated that his records reflected 46 calls in which an AMR ambulance was unavailable. Finally, Town officials indicated there was no contract with AMR for their services. The AMR General Manager verified there is no performance based contract, but indicated that AMR holds the "Primary Service Area Responder" at the Mobile Intensive Care Unit (MICU) paramedic level of care for the geographic boundaries of the Town of Enfield.

The Police Department operates the communication center for the police department and the fire departments through an enhanced 911 system. There are approximately 45,000 police calls and 5,300 calls for fire service each year.

The Town of Enfield's geographic size (33.8 square miles), population base of approximately 48,000 (year 2000 estimate), and a relative wealth of resources (fire service and police department) would seemingly make the delivery of emergency medical service care easy to accomplish. However, when one takes into account the variations and changes affecting the public safety service and the political climate, the problems become significantly more complex.

Significant changes are constantly occurring to the delivery of emergency medical services. Therefore each and every component of the emergency medical service system must be evaluated for its effectiveness. This must be accomplished based on current benchmarks of care, inter-agency cooperation, and cost-benefit analysis. The variety of emergency and public safety services within the Town represents a significant challenge for its leadership, but one which must be dealt with.

Twelve (12) essential components of Enfield's EMS system were reviewed. In addition, the basic structure of the overall public safety system was reviewed. For each component reviewed, benchmarks were developed, key issues assessed, recommendations and potential impact identified.

CHAPTER IV EXECUTIVE DISCUSSION

The concept of performing an audit of the Town of Enfield was initiated when Town officials, and various public safety providers in the community wished to evaluate the entire process of providing emergency medical care to the citizens of the Town of Enfield. The Ludwig Group, LLC was contacted by officials of the Town of Enfield and asked to submit a Proposal for the purposes of conducting a system-wide audit with respect to the delivery of emergency medical service care. Through a competitive bid process and presentation format, The Ludwig Group, LLC was awarded a contract on December 18, 2000.

In performing the requested analysis, The Ludwig Group, LLC compared the Town of Enfield to the national experience with development and implementation of EMS systems. On a national basis, the modern model of EMS delivery originated in the mid-1960s and has been evolving since that time. Communities have faced many challenges in planning and implementing EMS systems. Through research and practical experience, a wealth of knowledge has been gained about how to most effectively assure the delivery of emergency medical services to the public. No community needs to work in a vacuum when attempting to assess or improve its EMS system. Chances are very good that benchmarks exist to assess how well a system functions and solutions have been developed that can be adapted. This process used national benchmarks as an essential component of the system assessment and identifies well-established strategies that have worked successfully in many communities throughout the country.

As the national experience with EMS delivery has evolved, it has become clear that delivering quality emergency medical services involve much more than an ambulance service. Providing quality EMS involves the sophisticated integration of a variety of public safety resources into a **system.** Any one of the resources, used in isolation, will result in less than satisfactory results. It is only through the combination of resources that true system effectiveness can be achieved.

An EMS or medical transportation system is comprised of multiple components. Its functioning is based upon the coordination and cooperation of, sometimes, multiple agencies and individuals working together with a common plan to achieve the desired outcome.

This effort is both a system's greatest strength and potentially its most significant weakness. If cooperation and coordination break down, the system becomes fragmented and the participants are unable to perform at optimum levels.

EMS systems have, as their primary goal, to deliver the most appropriate emergency care to someone in need, in a timely manner. There are two key components in this statement:

> **TIME:** This is the issue that most significantly effects survival for patients experiencing life-threatening emergencies. The most sophisticated, well-trained prehospital providers in the world do not do a patient any good if they do not arrive in time. In order to best serve the public, any EMS system must get help to people within clearly established time limits.

> **LEVEL OF CARE:** Getting the right level of care to people is almost as important as the time issue. The most important services that can be provided to a patient are the basic-level skills of CPR, defibrillation, and control of life-threatening bleeding. Sophisticated, advanced life support paramedics in ambulances do not need to arrive until much later, if good basic and advanced level emergency care is provided quickly.

The system recommendations for the Town of Enfield, contained in this document, are intended to assure that the Town of Enfield EMS system delivers the right level of care in the right amount of time. The principle national benchmarks used as the foundation for these recommendations are:

20. Bystanders can provide the most basic emergency medical care, if they are given the proper verbal instructions on the telephone. 911 dispatchers appropriately trained and equipped can provide this service, known as Emergency Medical Dispatch (EMD). EMD is the national standard today in 911 dispatch centers across the country.

21. Basic emergency medical providers, who can breathe for the patient, circulate blood using closed chest compression, use an automatic external defibrillator to shock the heart, or control life-threatening bleeding, must arrive at the patient's side in four (4) minutes or less. The four (4) minute benchmark has been clearly established as the point beyond which the brain cannot survive without an adequate supply of oxygen. The national benchmark is that this basic-level response should occur in four minutes or less (<4:59) with 90% reliability. It does not make any difference what type of vehicle these basic responders arrive in. Their job is to be the first to arrive and begin basic life support. For this reason, these providers are called "first responders."

22. With EMDs providing immediate assistance, backed up by basic-level response in four minutes or less, the next layer in an EMS system is advanced life support (ALS), most often provided by paramedics. The benchmark for time period varies from community to community and can range from six minutes up to sixteen minutes, with 90% reliability. However, studies done by the National Heart Association reflect that the shorter the delivery of advanced life support, the greater chance the patient has of survival.

23. The final system component is effective transportation to appropriate medical facilities for definitive care.

This report compares the Town of Enfield to these national benchmarks and makes the necessary recommendations for the Town to enhance existing services.

EMS Models

There is estimated to be over 80 different models for configuring an EMS system by today's standards and deployment schemes. Contrary to popular belief, an EMS system is not strictly limited to an ambulance showing up at a scene and transporting a patient to a hospital. Today's sophisticated EMS system encompasses three main components; communications, first response, and EMS transport. By combining various components from the X and Y axis in Figure 1, various EMS models can be developed which serve the needs of a community. Key to the success of any system not shown in Figure 1 is the 911 communications center and the fiscal health of the system.

In developing this proposal, various models were examined and judged as to the practicality of deployment in the Town of Enfield. Examples of other possible models could be the five fire departments in the Town providing all first response and transport services; The police department continuing first response and transport services; Contracting transport services to a private commercial ambulance service with fire and police first response; Police first response and a volunteer corp transport service; and fire first response with police transport.

Evaluation of each possibility was eliminated based upon resources, willingness of participation from care providers, fiscal practicality; continuity of service, and demonstrated past performance.

Feasibility of Contracting to American Medical Response

This option was eliminated based upon a lack of future reliability as a provider. The existence of American Medical Response (AMR) in the future is questionable.
Laidlaw, who owns American Medical Response, is a publicly held Canadian corporation. Late last year, Laidlaw was delisted off the New York Stock Exchange for failure to maintain a minimum stock price.

Currently, Laidlaw is the largest provider of inter-city bus service (Greyhound); student transportation (school buses), emergency department physician services (EmCare and Spectrum), and ambulance services.

In announcing the 1997 acquisition of AMR, Laidlaw predicted annual revenues of $1.2 billion and earnings of 15 percent or more, based upon existing business and expected post-acquisition efficiencies. Key to their success was the development of American Medical Pathways (AMP), a medical call center service developed by AMR to capture requests for unplanned medical care on behalf of managed care clients. These requests would then be triaged at the call center to reduce unnecessary use of ambulances and emergency department services.

In the three years since the acquisition of AMR by Laidlaw, AMR has lost over a third of its annual revenue[1] and has never achieved planned earnings. The AMP service has stumbled and landed flat on a largely unreceptive managed care audience. Contracts with cities, healthcare systems and managed care organizations have been lost or not renewed. Operations and divisions have been terminated, and they have exited several major markets, including Philadelphia and Chicago. The entire senior management team has turned over, some positions more than once, and they currently have their 4th CEO since the merger. Over 2,000 positions have been eliminated through turnover and reductions in force, with more on the horizon.

The following is a summary of Laidlaw's most recent end of year financial reports, ending August 31, 2000. Separate line items for AMR are not available as they are combined with other healthcare service each year, and have not been reported in fiscal year 2000 as they have been classified as a "discontinued operation."

(In $ million except for share amounts)	Laidlaw[2]		
	1999	1998	1997
Revenue	2,263	2,056	2,093
Income (Loss)	234	248	219
Operating Margin	10.3%	12.0%	10.5%
Net Income (Loss)	(1,119)	346	611
Earnings (Loss) per share	(3.39)	1.05	1.92

The above table reflects a lack of revenue growth, operating margins that did not meet expectations and unprecedented losses in 1999. These trends appear to have continued in 2000, as reflected in the current value of Laidlaw stock and the company's desired divestiture of its healthcare operations.

Laidlaw announced its desire to sell AMR. On several occasions, Laidlaw had nearly completed the sale of AMR, but those deals fell through. The asking price is estimated to be $500 - 550 million.

In summary, the AMR division of Laidlaw has never achieved desired or expected operating margins.

AMR does operate in other communities around Enfield. Besides providing transport services to the City of Hartford, AMR has a contract with the City of West Hartford.

Currently, the City of West Hartford contractually pays AMR $265,000 per year to have a paramedic available

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[1] Laidlaw's annual ambulance revenue after combining existing operations with AMR was over $1.2 billion and the current revenue is estimated to be $700 - 800 million.

[2] Source: Laidlaw's Annual Report

24 hours a day, seven days a week, with a second paramedic available from 0900 hours until 1700 hours daily to respond to medical emergencies. There are response time performance criteria which requires a 7 minute response time if there is one paramedic on duty and 5 minutes if there are two paramedics on duty. There is no requirement to have an ambulance in town but there is a response performance criteria to have an ambulance on scene in 8 minutes.

In speaking with officials from the fire service in West Hartford, the city is described as being a suburb of Hartford which is affluent. As a result of the financial status of the citizens in this community, the collection rate is quite high and fire officials estimate AMR collects somewhere between $2 - 3 million in revenue from transports in West Hartford.

The contract is currently up for renewal and is under negotiations. The new contract is expected to be in the area of $300,000 - $325,000. Additionally, the fire service is West Hartford has proposed taking over the EMS services in their community.

When this Consultant met with the Operating Manager from AMR for purposes of this study, this scenario and the future existence of AMR serving the Town of Enfield was questioned. It was the Operation Manager's belief that AMR would be sold to a group of investors and AMR would continue operation in Enfield, or AMR would be broken apart and various operations sold, one being the Greater Hartford and northeast Connecticut operation - thus continuing ambulances in Enfield under another name.

It is the conclusion of this Consultant that the AMR Operations Manager's opinions are a possibility, but not a certainty - especially in lieu of AMR's liability to Laidlaw. Thus, the possibility of contracting out ambulance operations to AMR under a performance based contract with financial reimbursement was eliminated as an option.

Feasibility of Establishing 3rd Service Model

This model was dismissed for several reasons.

There are no current structures to house ambulances, crews, and living quarters which are geographically distributed throughout the community which would achieve minimal response times. In order to build such facilities, there would be an unnecessary cost incurred to the system.

The various fire stations throughout the community are properly and geographically distributed to house ambulances, crews, and their living quarters. To build additional facilities would be a duplication of facilities.

Another factor which dismissed this model is that there are human resources already in place to staff and man the proposed model. For the Town to hire additional personnel and train them, again, would be a duplication of existing resources which are already in place.

Economy of scale savings for the Fire Districts with respect to labor costs is possible because of the 207(k) exemption of the Fair Labor Standard Act. A third service model would be required to pay employees overtime for any hours worked over 40 in one week and over 80 in two weeks.

The Public Consortium EMS Model proposed for the Town of Enfield provides a true "public safety net" of emergency medical services for the community.

Figure 1

	No First Response	Police ALS First Response	Fire BLS First Response	Fire ALS First Response	Police BLS First Response
Fire; Cross-Trained ALS Transport					
Fire; Cross-Trained BLS Transport					
Fire; Single Role ALS Transport					
Fire; Single Role BLS Transport					
Police; BLS Transport					
Police; ALS Transport					
Private; For Profit Transport					
Private; Not-for-profit Transport					
Military Transport					
Hospital-Based Transport					
Third Service Transport					

Volunteer BLS Transport					
Volunteer ALS Transport					
Public consortium Transport					
Ambulance District Transport					
Helicopter Transport					

CHAPTER V EMS SYSTEM REVIEW and ANALYSIS

The modern model for delivery of emergency medical services (EMS) has been evolving since the mid-1960s. Throughout the country, during this 30+ year evolutionary process, systems have developed to the point that are commonly accepted standards or benchmarks that can be used to describe EMS systems and to evaluate them. These industry benchmarks originate in a variety of sources and serve as the conceptual framework for this system analysis. All of the benchmarks in this report can be found, in various forms, in the original *"15 Essential Components of an EMS System"* that were identified in the federal EMS legislation of 1973, and in the new *"10 EMS System Standards"* used currently by the *U.S. Department of Transportation* (1995) to evaluate state EMS systems. In addition, these benchmarks can also be found in the standards of the *Commission on Accreditation of Ambulance Services* (1994) and in the EMS accreditation standards developed by the *International Association of Fire Chiefs* (1995) and in the contracting guidelines developed by the *American Ambulance Association.*

Today, a model EMS system has a number of clearly identified components that work together in a well-coordinated fashion to provide the public with a dependable, reliable, efficient, and cost-effective EMS system. These systems reduce mortality while providing effective stewardship of the public treasury. The basic elements of a modern EMS system include:

u	An educated public that knows how to effectively access the system and use its resources wisely.

u	A single, well-publicized method for the public to access or "turn-on" the system. This is a 911 public safety answering point (PSAP) that utilizes an Enhanced 911 (E-911) system that provides dispatch personnel with location information based on the telephone billing records for the caller. Dispatchers are trained in Emergency Medical Dispatch (EMD). Based on protocols, policies, and training, the dispatchers are able to provide initial emergency medical instructions to callers while help is on the way. The dispatchers are also able to mobilize all system resources to respond to requests for emergency medical assistance. The dispatch system uses state-of-the-art computer-aided dispatch (CAD) hardware and software that gives dispatchers real-time information about system resources and collects system data in a form that can be used to analyze and improve the system. The CAD automatically tracks response times and response time statistics are tracked using the fractal method, rather than the inappropriate "average" method.

u The first critical step to saving lives and reducing morbidity in an EMS system is to provide basic-level emergency medical response within four (4) minutes of the request for assistance, with 90% reliability. There is no need for the sophisticated, advanced level providers to have this low response time, but basic level providers, who can open an airway, initiate CPR, control bleeding, and use an automatic external defibrillator (AED), must be on the scene quickly. The BLS providers can also serve as extra hands to assist the ALS providers once they are on-scene. The minimum level of training for these BLS initial responders is the First Responder training program developed by the U.S. Department of Transportation. Alternatively, these basic responders can also be trained at the Emergency Medical Technician-Basic level. At both levels, the personnel also be must trained to use the AED.

u Paramedic providers, with the full scope of advanced life support skills and equipment need to follow the BLS response. The ALS response must have a maximum response time of eight (8) minutes or less with 90% reliability. The paramedics provide any additional, sophisticated care that may be required.

u The entire system must have the active involvement of a physician medical director who is actively involved in system design, training, and quality improvement activities.

u The system will actively examine itself and make adjustments necessary, from a clinical and operations perspective.

The documents mentioned earlier describe a series of factors that are essential in putting in place a modern EMS system. The remainder of this report will deal with each EMS system factor, discuss well-accepted industry benchmarks, describe our findings in relation to the benchmark, and provide a set of recommendations aimed at allowing the Town of Enfield to achieve a modern, model EMS system.

Management Structure

Benchmark

The long term success of an EMS system is predicated on the quality and effectiveness of the management authority, team, and processes. Attributes of successful system management include the same factors that apply in many other industries. Management needs to be organized and based on appropriate planning and measurement. Clear lines of responsibility/authority need to exist and effective communication mechanisms need to be in place. Finally, system managers and leaders need to maintain the "system" perspective at the same time they are dealing with more focused issues.

Findings

The current management structure for the EMS system in the Town of Enfield was reviewed. There is no formalized structure responsible for the management of the entire EMS system. When the term "management of the entire EMS system" is used, it can be defined as the individual who provides coordination of the entire system (communications, first response, and transport) from the operational, administrative, and logistical perspective. For example, all six public safety agencies purchase medical supplies separately. There is no coordination to ensure one piece of medical equipment being ordered by one agency is compatible with another piece of medical equipment which another public safety agency is ordering. Additionally, when six separate public safety agencies order medical supplies, the system loses the opportunity for bulk order discounts and competitive bidding for more economical pricing.

It was noted there is a formalized management structure for each of the individual public safety agencies. However, it was noted that there is no person directly responsible for the delivery of emergency medical service care in the Town of Enfield, even though 53.3% of all calls which the fire service responded to and 8.2% of all calls which the police department responded to in 2000 were EMS related. The Fire Chief in each respective fire department and the Police Chief have responsibility for the overall operation of EMS in their respective areas. The Police Chief is listed under the Office of Emergency Medical Service for the State of Connecticut for the EMT/MRT and defibrillation program, and Stanley Halgas from the John Maciolek American Legion Post 154 is listed as the CEO with the State of Connecticut for the Enfield Community Ambulance.

Paramedic response in the Town of Enfield is provided through what appears to be a loosely agreed upon relationship with American Medical Response. Even though no written contract was produced, it is a loose relationship under which the ambulance service assumes responsibility for basing an ambulance and providing advanced life support service in the Town. American Medical Response is responsible for billing the patient for all transport services and receives no reimbursement from the Town of Enfield or any of its public safety agencies.

While each agency has its own individual organizational structure, the ideal EMS system requires that the services work well together. There must be a clearly defined and managed structure to allow this to occur. The formation of an oversight board to establish policy and ensure quality of the system would help to create an ideal EMS system in the Town of Enfield.

The Enfield Police Department is the lead agency that is most active in supporting the EMS system. The PSAP is housed and staffed by the police department with civilian dispatchers. Also, the police department and individual patrol officers are actively involved in responding as first responders, and if necessary, responding to the Public Safety Complex to pick up the ambulance and transport it to the scene of the incident.

As is often the case, all six public safety agencies and the private agency function together on the street. In addition, the police officers, fire fighters, and ambulance personnel seem to get along well on an informal basis. However, there is no formalized system structure that provides a foundation for formal cooperation between the public safety agencies and the private ambulance service. The organization leaders of each respective public safety agency also seem to function well and cooperatively with each other. However, the removal of one individual from this structure and the replacement of another individual with the wrong personality could upset this balance of cooperation and functionality. This imbalance could lead to further system inefficiencies.

Human Resources

Benchmark

A key source in any EMS system is the human resource - the people who actually make the system work.

Systems have a number of choices as they develop. The demographic aspects of the system catchment area often dictate workforce decisions. Systems may choose to develop all-advanced life support systems that put paramedics everywhere in the system or they may choose to implement an all-basic life support system. Many systems have found it effective to implement multi-layered or tiered systems that widely disperse BLS providers with the most critical life saving skills and then support them with ALS providers who arrive at a later time with more advanced equipment and training.

Regardless of system structure, the goal is to recruit, educate, and retain EMS system personnel in sufficient numbers to provide service throughout the system that meets the performance standards agreed to by the community and the providers. These providers then need to be appropriately dispersed throughout the system and efficiently utilized.

Findings

Impressively, the police chief and most members of the Enfield Police Department are licensed Emergency Medical Technicians. EMT licensure is necessary for maintaining a position as a police officer**.** In today's law enforcement community, this attitude toward EMS is unprecedented and the Police Chief is to be commended for maintaining this standard within the police department.

However, one theme commonly heard by the Consultant during the course of the study came from Police Officers who expressed an interest in providing first responder services, but were not interested in EMS transport. It was the belief of the police officers that they could better medically serve the community by resuming the patrols in their respective areas, prepared for quick response to another medical emergency, instead of transporting a patient to the hospital, essentially removing them from their patrol districts.

There are 14 civilian telecommunicators which work in the police communications center evaluating 911 telephone calls and dispatching police, fire, and medical emergencies. Approximately six of the telecommunicators are certified as Emergency Medical Dispatchers.

Of the five fire departments in the Town of Enfield, each one has a full-time paid Fire Chief with an elected Board of Directors. One department (Thompsonville) is an all career department and the remaining four are combination departments (career and volunteer fire fighters) with the predominance of career members staffing apparatus during normal business hours, supplemented by volunteers during the business hours, evenings, nights, and weekends. The licensure levels vary from Medical Response Technician (MRTs) to paramedics. Only two licensed paramedics were located throughout the entire five fire departments. Shaker Pines and North Thompsonville fire departments each have one volunteer fire fighter who is licensed as a paramedic.

Most transports of patients to a hospital utilizing an Enfield Community ambulance are staffed by one police officer and one fire fighter. However, if no fire fighter is available, two police officers will transport the patient to the hospital. Conversely, two fire fighters are used to transport the patient to the hospital when police staffing is compromised.

Documents reflect numerous times and occasions when "chase" cars in the Enfield, North Thompsonville, and Hazardville fire departments were left unstaffed. Further investigation revealed these time periods were reflective when no manpower or volunteers were available. The range of "out of service" time ranged from a few minutes to greater than 17 hours. It was particularly evident around holidays and weekends. The staffing of these “chase” cars by the fire departments was never mandated, but are attempts by the various fire departments, and their members to enhance the delivery of emergency care in the community. The members of these fire departments, particularly the volunteers are to be commended for their efforts toward this effort.

Communications

Benchmark

An effective EMS system provides an integrated communications function that includes:

- Public access through a well-publicized single number, preferably 911.
- Enhanced 911 (E-911) capability.
- Single (Public Service Answering Point) PSAP for the system.
- Effective connection between PSAP and dispatch points with minimal hand-offs required.
- The capability to provide pre-arrival instructions and priority dispatching.
- Common radio frequencies and equipment so that system resources can talk to each other.
- Data collection concerning EMS system response times. The following times should be routinely and accurately tracked, at a minimum:
    - Ø Receipt of Call
    - Ø Dispatch of Units
    - Ø Units Responding
    - Ø Units at Scene
    - Ø Personnel at Patient
    - Ø Units En route to Hospital
    - Ø Units at Hospital
    - Ø Units Available for Service

Findings

All persons interviewed and observed at the Enfield Police Communications Center, including the Officer responsible for its operation were highly professional, knowledgeable, candid, and had positive attitudes. They acknowledged the existence of problems with the current system and looked forward to suggestions for improving the system.

There is a 911 system with a single Public Safety Answering Point (PSAP), operated by the Enfield Police

Department.

The Enfield Police Department utilizes Enhanced 911 (E-911) and has been using a Computer-Aided Dispatching (CAD) system for quite some time. The communications center does and should serve as one of the primary data collection points in an EMS system.

The CAD system has no capability of recording the arrival time of different EMS system components. The CAD merely records the arrival time of the first public safety agency on the scene instead of distinguishing between arrival times for first responders and ambulance transport. This made it difficult to actually determine arrival times of the Enfield Community ambulances and AMR.

There is no established objective criteria or response matrix for determining which and the appropriate amount of resources to respond to a medical emergency. Dispatchers at the Enfield Police Department must manually determine response objectives with respect to what apparatus goes to which geographic address based upon the nature of the assignment and what is available. An ambulance is based at the Thompsonville Fire Department 24 hours a day, seven days a week. However, a medical call only one block outside their response district would elicit a response from American Medical Response or a police officer would have to pick up an ambulance at the Public Safety Complex and transport it to the scene. Under this scenario, the police officer picking up the ambulance and responding to the scene would have a much greater response time than a response from an already response-ready statically based ambulance from the Thompsonville Fire Department station.

The general observation for the dispatching of care providers to a medical emergency is essentially dispatchers utilizing subjective judgement and attempting to find a resource to send. During the last year, it was necessary for the Town of Enfield to request mutual aid ambulance service 40 times from surrounding communities, such as, East Windsor, Longmeadow, Suffield, etc. The previous year, mutual aid EMS service was requested 27 times. The past year versus the previous reflects a 32.5% increase in requests.

Observations and interviews with dispatchers reveal only six are trained and certified as Emergency Medical Dispatchers (EMD). Some dispatchers revealed the decision to provide pre-arrival instructions to a 9-1-1 caller varies from dispatcher to dispatcher and there is inconsistency with providing those instructions.

The five fire departments pay an annual fee of $50,000 each year for dispatching service by the Enfield Police Department.

The staffing of the communication center is within the normal standards for the call volume experienced in the Town of Enfield.

Transportation, Vehicle Deployment

Benchmark

Safe and reliable transportation is a hallmark of effective EMS systems. The system makes effective use of resources and provide for the smooth integration of ground and air transportation systems.

There are several universally accepted methods for measuring how efficiently transportation resources are being utilized. Ambulance response is linked to the availability, which is the inverse of ambulance usage.

One method is the concept of Unit Hour Utilization(UH:U), the ratio of the number of unit-hours spent delivering EMS to the total number of unit-hours that the system could possibly deliver. Essentially, each hour that an ambulance is staffed and available for service is a Unit Hour. Total unit hours available in the system are divided into the number of transports by one standard or the total number of runs by another standard to arrive at a measurement of Unit Hour Utilization . Nationally, efficient systems function in the range of 0.30 - 0.40 UH:U. Systems in urban settings are toward the high end of the range, while systems in suburban-type communities operate toward the lower end of that range. By some standards, an UH:U less than 0.30 means that transport resources are not being used efficiently, while UH:U in excess of 0.40 is over-utilization. However, this standard can vary from community to community.

Additionally, different systems measure effectiveness in different formats. For example, a paramedic/fire fighter is not strictly limited to EMS work. Many fire systems determine Unit Utilization Hours not only on EMS work, but fire suppression, training, public education, inspections, etc.

Findings

There are two ambulances owned and operated by the Enfield Community ambulance service. One is a Type II and the other is a Type III. Plans are under way to purchase another ambulance. Another ambulance is owned by the Enfield Fire Department, but is not operational.

The following findings were determined for the Town of Enfield for the reporting period of 1996 through 2000.

Call Volume				
1996	1997	1998	1999	2000
3,140	3,014	3,263	3,464	3,680

Transport Volume				
1996	1997	1998	1999	2000
2,393	2,241	2,407	2,572	2,894

In summary, the Town of Enfield experienced approximately 10.082 calls per day in 2000, almost a 6% percent increase over the year before. Transport volume increased slightly over 11 percent versus the previous year.

Future Call Load

The following chart, using linear regression shows future anticipated call volume.
Based upon future trending, call load volume in the Town of Enfield is anticipated to reach over 4,100 calls

per year by 2003.

An examination of time distribution versus EMS call volume was examined. The findings represent what is traditionally an allocation of calls for a conventional EMS system. EMS call volume is somewhat predictable. The more people, the more active they are, the greater the amount of EMS calls.

It was somewhat difficult to determine the UH:U ratio for the Enfield EMS system. Although the two Enfield Community ambulances could be configured into the UH:U ratio, the unknown factor was the availability of an AMR ambulance. Data provided showed that the AMR ambulance was unavailable a minimum of 241 times during the year 2000.

In order to determine some UH:U ratio, several different formulas were applied. The first formula presumed that the AMR ambulance was available only half of the hours available in the year.

$$\frac{\text{3,680 (number of EMS runs)}}{\text{2.5 (number of ambulances x 8,760 (hours in year)}} = .16$$

The second formula presumed that the AMR ambulance was available 100% of the time.

$$\frac{\text{3,680 (number of EMS runs)}}{\text{3 (number of ambulances x 8,760 (hours in year)}} = .14$$

Although, the UH:U appears low, the explanation can be found when a 24 hour shift is broken down into eight hour segments. During the year 2000, the following eight hour segments reflect a significant difference in call distribution:

Call Distribution/Time/Amount/UH:U/Median Calls Per Shift

Time	# Calls	UH:U (3 ambulances)	Median Calls Per Shift
0800 - 1600	1,623	.18	4.44
1600 - 2400	1,398	.15	3.83
2400 - 0800	659	.07	1.8

When the 2400 hours to 0800 hours period is examined more closely, the median call volume during this period was 1.8 calls for the year 2000, with the vast majority (134) coming during the hours of 0700 - 0800.

System Financial Analysis

Benchmark

The goal of any EMS system is to make maximum use of potential revenue streams. It has been clearly demonstrated in a number of EMS systems throughout the country (including fire, private and volunteer systems) that well-managed, efficiently run systems can survive with minimal subsidization. Subsidy, when it occurs, is most often required by political and practical considerations such as the need to serve remote locations or locations with poor payer mixes. Specifically, experience has shown that a minimum population base of 250,000 is necessary in order for an ambulance service to be self-sufficient. Systems serving populations less than that will be required to provide some sort of external funding in addition to the amount recouped through reimbursement.

The goal of any system is a careful balance between the community quality care and response-time standards and operational efficiency. While it would be wonderful to park a paramedic-staffed ambulance on every street corner, it is extraordinarily expensive. Alternatively, it would be inappropriate to have unacceptable levels of mortality and morbidity in the system. A balance that is "right" for the community is what needs to be sought out and achieved.

Aggressive analysis and management of both system expense and system revenue will achieve this balance.

Findings

The principal funding source for the EMS system in the Town of Enfield is the John Maciolek American Legion Post 154. The present and past members of the Maciolek Post are to be lauded for civic efforts over the years to provide the community with such a vital and necessary service. It is truly unusual to see this level of commitment from an organization who is not mandated to perform this service. The Maciolek Post operates as a non-profit organization and is exempt from paying federal and states taxes under IRS provision 501(c)(3). The main source of funding comes from fund raising, donations, and memorials as a result of solicitation of the community**.** Documents produced by the Maciolek Post include an independent auditor's report from Mercik, Kuczarski & Bolduc, LLC dated May 3, 2000. Operating expenses for the year ending December 31, 1999 totaled $104,870. The Post raised $89,132 for the period ending December 31, 1999. The operating loss of $14,948 was offset from interest, dividends, and capital gain distributions ($45,739) for an excess of revenues over expenses of $21,233. The year previous (1998) saw operating expenses similar to 1999 ($102,482) with a total of $69,687 raised through donations and memorials. After the addition of interest, dividends, capital gain distributions, and net gain on investments, a total of $100,831 was generated to offset the operating expense of $102,482. The deficiency of revenues over expenses was $1,651 for 1998.

In addition, the Post in 1994 created an endowment trust with the goal of generating operating income and meeting long-term capital needs. As of December 31, 1999, the balance in the endowment trust was $411,881. In interviews with members of the Post, it was determined their goal is to reach $1,000,000. The goal of this dollar amount is to make the operating fund self-sufficient.

Additionally, although there has been an auditor's report generated for calendar year 2000, it is anticipated that because of a depressed liquidity market during the last nine months of year 2000, the marketable securities will probably see a loss.

The Town of Enfield has no budget committed to the delivery of emergency medical service. This is highly unusual for a community this size to have no funding directly committed to the operation of an EMS system.

Indirectly, the Enfield Police Department supports the emergency medical service delivery system through paying the salaries of officers who are trained as EMTs and also paying those officers an EMS stipend ($26,100). The EMS fund from the Maciolek Post does not pay for officers on overtime for training purposes.

Also, indirectly, the four fire departments who provide emergency medical service supplement have some direct cost as a result of delivering emergency medical service care. As an example, the Thomponsville Fire Department saw a significant rise in their workman's compensation insurance after assuming EMS duties.

The process of paying for some of the necessities of operating an EMS system in Enfield is somewhat uncoordinated. As cited earlier, all public safety agencies in the community purchase medical supplies on an individual basis from a single sole source medical supplier. As a result of this methodology, the opportunity to achieve economy of scale savings from bulk purchasing and a competitive bid process is lost.

If an individual is transported on an AMR ambulance, they receive a bill for transport and treatment services. If an individual in the community is transported on one of the two Enfield Community ambulances, there is no charge for the service.

This disparity of rendering a bill for transport services has caused some consternation and confusion**.** In interviews with care providers, many individuals who were in need of advanced life support services would insist on going with the "free ambulance." The obvious issue in this scenario is that the "free ambulance" is only basic life support capable. Thus, citizens in the community who may need definitive care lose that opportunity because of their financial concerns.

Dispatchers also report incidents where 911 callers, upon calling for an ambulance say, "send the free ambulance", and in one reported case, an individual who resides outside the community drove to a convenience store inside the Town of Enfield, called 911 and requested the "free ambulance."

Performance Improvement (PI)/Data Management

Benchmark

A comprehensive Performance Improvement program is required to effectively implement and maintain an EMS system. There are two distinct components to such a system. Operation Performance Improvement and Clinical Performance Improvement. Industry standards are currently available through the standards of the Commission on Accreditation of Ambulance Services and the EMS component of the International Association of Fire Chiefs Fire Department Accreditation Program.

An effective Performance Improvement program identifies standards and puts in place the necessary data gathering, analysis, and feedback processes to assure that the system is constantly improving. Performance Improvement is a mind-set. The concept is that the system is constantly examining itself and constantly changing.

Findings

There is no quality assurance or improvement program internally operational in the four fire departments and Enfield Police Department. However, there is an outside agency which handles quality improvement for the Enfield EMS system. The outside agency is Johnson Memorial Hospital.

The standard which Johnson Memorial Hospital applies to quality improvement within the system is to pull and review every 10th patient chart generated by care providers in the EMS. If there is a problem or an opportunity to improve the system or an individual's skill performance, the EMS Coordinator for Johnson Memorial Hospital contacts the chief (police or fire) for whom the care giver works. This decentralization for addressing issues within the system further demonstrates fragmentation and uncoordination as a system.

A review of the Johnson Memorial Hospital EMS Quality Assurance Review document reflects a comprehensive and complete document which assesses medical calls in various categories such as Data Tracking, Documentation Assessment, and Document Rating. Additionally subcategories include Reason for Review; Diagnosis Correlation; Action Taken/Required; and Recommendations.

According to Johnson Memorial representatives, one of the most important issues affecting the process of quality improvement in the Town of Enfield is poor documentation by the care providers on patient charts.

There is no Quality Improvement program in place for care provided by first responders.

There is no Quality Improvement/Assurance program in place for 911 calls screened by telecommunicators and/or any pre-arrival instructions provided to callers.

Medical Accountability

Benchmark

Effective EMS systems provide a role for the physician EMS medical director. The physician is involved in many aspects of the operation from establishing the clinical standards of care to the Performance Improvement process and continuing education. The role of the EMS medical director should be defined in writing and any agreement for services clearly defines mutual responsibilities and expectations.

Findings

The Medical Director for the Enfield EMS system is Dr. Charles Bizilj. Dr. Bizilj is the Medical Director responsible for emergency services at Johnson Memorial Hospital. Paul Wentworth is the EMS Coordinator for Johnson Memorial Hospital.

Johnson Memorial Hospital provides QI/QA on every 10th chart and provides feedback to the care provider's organization. Johnson Memorial Hospital additionally provides medical control because of the automatic defibrillator program and provides training for defibrillation, epinephrine pens, and combitubes airway devices. Additionally, Mr. Wentworth provides educational opportunities with care provider organizations on a train-the-trainer concept. Finally, because of the Ryan White Comprehensive Health Care Act, the hospital has an infectious disease control officer who makes contacts with field providers who may have suffered a significant exposure from a source patient.

Public/Customer Service

Benchmark

EMS systems are complex organizations, with varying degrees of formality that exist to provide a valuable public safety service. As with other service industries, the EMS system needs to be designed and maintained with customer/patient input. The system should provide the level and quality of service desired by its customers/patients within time frames and at a cost that is acceptable. Therefore, it is critical that any EMS system have in place a formal mechanism to provide customer feedback to those who design and manage the system.

Findings

There is no formalized process for the collection of customer/patient input. However, members of the Maciolek Post report countless letters complimenting the service provided.

There was no formal mechanism discovered which would allow for customers to file complaints, how those complaints would be investigated and resolved, and if necessary, how the system could be improved if the complaint was discovered to be a system problem through the investigation.

EMS Education

Benchmark

EMS systems must provide for initial and continuing education for all providers in the system. There are a number of effective models for accomplishing this and include agencies doing training internally, use of outside educational institutions such as community colleges or vocational schools, or hospital-based training. The EMS education system must provide for appropriate physician involvement and must also provide the opportunity for students to obtain the necessary practical experience in addition to classroom knowledge.

Findings

There is an EMS educational component operated by various community colleges throughout the community as a whole. Additionally, the EMS Coordinator from Johnson Memorial Hospital occasionally provides continuing education courses at the fire departments.

The Enfield Police Department does have a Training Officer who administratively tracks police personnel, their amount of CEUs, and/or whether a license has expired.

Public Information, Education, and Resources (PIER)

Benchmark

Effective EMS systems have in place formal and effective programs to reach the public with a variety of information about the system. "Public" refers to all of the public served by the system including physicians, hospitals, and the public at large. System information might include access mechanisms, injury prevention, appropriate use issues, etc.

Findings

Overall, there appears to be little coordinated effort between the police department and the fire departments with respect to PIER programs.

No PIER programs were identified within the EMS system.

Operations

Benchmark
This section is discussed in Chapter 3.

Findings
This section is discussed in Chapter 3.

Other Associated Components

Benchmark
This section covers other components of an EMS system which may not fall into other sections. For example, some components covered could be safety issues, infectious disease, and other issues which may be pertinent just to the State of Connecticut.

Safety issues and infectious diseases are important issues in today's modern EMS system. Where EMS systems have had poor infectious disease programs, large clusters of providers have been identified as being contagious for various airborne and bloodborne pathogens. Recently, the Philadelphia Fire Department has reported over 6% of the workforce being positive for Hepatitis C. Traditionally, the Philadelphia Fire Department has had a poor infectious disease program.

Findings
All providers in the EMS system in the Town of Enfield appear to have adequate protection, in the form of gloves, against bloodborne pathogens. No care providers reported difficulty in obtaining the necessary protective gloves for protection from bloodborne pathogens. However, when queried, other forms of protection were not available. This includes eye protection, gowns, and HEPA respirators.

All Enfield Community ambulances possess 1 ½ man stretchers which may prevent back injuries.

A police officer with the Enfield Police Department serves as the infectious disease control officer and is the liaison with Johnson Memorial Hospital when a patient has been determined to be infectious, or there is a significant exposure and source blood is needed from the patient. Johnson Memorial representatives report that they contact either the police officer or an executive member of the fire department where the care provider is associated. Beyond that, they receive no feedback if the employee was notified or if preventive treatment was initiated.

This decentralization of reporting mechanisms for infectious disease control issues continues to demonstrate no clear line of authority, and span of control over the system.

CHAPTER VI RECOMMENDATIONS

General Statement

In order to improve the delivery of emergency medical care in the Town of Enfield, there is a great need to coordinate all the main components (communications, first response and EMS transport) under one EMS

Advisory Commission. By doing so, it is anticipated that the survival rate and the level of service for citizens of the Town will improve significantly. By placing the delivery of emergency medical service under the direction of an EMS Advisory Board, there will be uniformity with respect to management, training, standard operating procedures, continuity of patient care, standardization of medical equipment; and standardization of rules and regulations.

It is recommended that initially the Town of Enfield should provide a minimum of three basic life support ambulances during the hours of 0800 and 2400. Based upon UH:U ratios and other data, the system can maintain a minimum of two basic life support vehicles between the hours of 2400 and 0800. Further, the system should maintain a callback mechanism to "recall' personnel if a shortage of ambulances occurs. Shortages of ambulances can occur during periods of increased intensity call loads or when an ambulance must "stand-by" for fires, hostage situations, drug raids, etc.

Additionally, it is recommended that the Town of Enfield have four ambulances in their fleet - in the event one ambulance is unavailable due to mechanical trouble, body work, or increased call load.

The system currently owns two ambulances with a third ambulance available from the Enfield Fire Department. A fourth ambulance would need to be purchased. Additionally, the current Type II ambulance should be used as the fourth ambulance and be attrited from the system when financially feasible.

Since the initial level of service in Phase I recommends basic life support, American Medical Response should continue with advanced life support service transport. This scenario will obviously impact finances since new reimbursement schedules in the future reimburse more for advanced life support services than basic life support transport.

EMS Agenda for the Future

With the implementation of a public consortium model for the Town of Enfield, attention should be given to a document produced by the National Highway Traffic & Safety Administration (NHTSA) entitled *EMS Agenda for the Future*.

In 1996, NHTSA gathered EMS community leaders to create a strategic plan for building the next millennium's EMS system. The *EMS Agenda for the Future* is built on the principle that EMS serves as the community safety net, catching the sick and injured who fall between the cracks of our social support systems. EMS of tomorrow will be the linchpin tying our community's public health, public safety, and health care systems together. It will provide the vital link to community members and continue to bring rapid, reliable care to those most in need.

The Agenda envisions an EMS system that is integrated with the health care system, proactive in improving community health, funded for service to the community, and accessible through both conventional landline phones and wireless phones.

There are ten critical objectives found within the document *EMS Agenda for the Future*.

- EMS must collaborate with community partners to address local health and safety issues.

- Financial incentives must be aligned to ensure that EMS, other health care providers, and health maintenance organizations are working toward a common purpose.
- EMS must be active participants in community-based injury prevention efforts.
- EMS must develop and pursue a consensus national research agenda.
- States and jurisdictions must enact legislation to support EMS development.
- EMS systems must allocate sufficient resources for medical direction.
- EMS systems must develop information links to EMS with other health care providers and public safety agencies.
- Research must be conducted to determine the costs and benefits of EMS to the community.
- 9-1-1 must be implemented nationwide as the emergency telephone number.
- All calls for emergency help must be automatically accompanied by information on the exact location of the caller.

The recommendations in the preceding section may include all or part of these ten critical objectives.

Additionally, the State of Connecticut requires certain criteria be satisfied prior to a political subdivision operating various levels of emergency medical service.

Recommendation #10: *Prior to proceeding with the implementation of a public consortium EMS system, the Town of Enfield should seek legal counsel to review the State of Connecticut, Department of Health, Emergency Medical Service Connecticut Statutes and the Town Charter. It is also recommended that legal counsel be used to review any regulations enacted by OEMS with respect to the Emergency Medical Service Connecticut Statutes prior to implementation.*

NFPA 1710 & 1720

Another standard which will be established in the near future and may affect the Town of Enfield is the National Fire Protection Association's (NFPA) Standard for the Organization and Deployment of Fire Suppression, Emergency Medical Operation, and Special Operations to the Public by Career Fire Departments (1710 Standard) and Standard for Volunteer Fire Service Deployment (1720 Standard).

The 1710 standard establishes fire and EMS standards for the organization and deployment of Career Fire Departments. As of this writing, the document is open for public comment and will be voted on by those on the committee in May 2001.

The only fire department in Enfield which it will affect is Thompsonville.

NFPA 1710 includes response time, certification, and minimum staffing requirements for career fire departments. The standard requires jurisdictions to enact these standards when another organization or private ambulance company provides EMS service.

NFPA 1710 establishes response time standards. Four minutes (240 seconds) is set for first responder arrival. Eight minutes (480 seconds) is stipulated for ALS unit arrival. Fire departments are to achieve this with 90 percent reliability. The most recent modification also contemplates 60 seconds turnout time. All total, nine minutes, 90% of the time is the aggregate amount. However, there is flexibility for fire departments to evaluate the standard annually and to consider geography within the jurisdiction when setting any objectives.

Within the NFPA 1710 standard is the certification of EMS personnel. Units that provide EMS care shall be staffed at a minimum with personnel trained to the first responder/AED levels. Units that provide BLS transports must be staffed with EMT-Basics. Units that provide ALS transport must be staffed with EMT-Paramedics, unless otherwise approved by the state agency responsible for EMS licensing.

Also with NFPA 1710 is a provision for EMS staffing. Units providing EMS must be staffed with at least two EMT-Basics. Units that provide ALS transport must be staffed with two EMT-paramedics. The standard provides enough flexibility that the two crew member assignments may be assembled from multiple agencies.

The NFPA is not a regulatory agency and cannot enforce their standards. However, many communities use NFPA as the basis for many standards, including building, fire, and electrical codes.

The extent of which the NFPA 1710 standard becomes accepted by communities is yet to be seen. However, if a voluntary standard becomes the accepted practice, then it becomes the standard against which juries consider an award.

The 1720 standard for volunteer fire departments basically states that each community or fire department establishes the standards for their own community. This standard will impact Enfield, North Thompsonville, Hazardville, and Shaker Pines.

With the move to a public consortium EMS model, the following are recommendations with respect to the benchmarks for an efficient EMS delivery system.

Management

Recommendation #11: *Create an EMS Advisory Commission.*

This group should be a seven member group consisting of a Town Council member, a Town official, the police chief, a member of the Enfield Fire Chief's Association, a representative of Johnson Memorial Hospital, a representative from the John Maciolek American Legion Post 154, and a citizen of the community who is not a stakeholder familiar with EMS knowledge. This group is responsible for establishing policy, direction, and accountability of the new system.

Recommendation #12: *Create a position of EMS Director.*

The EMS Director, although a Town employee must work in conjunction with the EMS Advisory Commission. The EMS Director is responsible for carrying out the recommendations and/or policies as set forth by the EMS Advisory Commission. Ideally, this person should demonstrate strong leadership, problem-solving, and decision-making abilities. Additionally, this individual should possess a paramedic license and be educated with respect to management, business or public administration. Because of the need to coordinate multiple public safety agencies, plus a civic minded organization, this individual should have strong facilitating abilities to produce a cooperative and cohesion environment among all chief participating agencies and organizations. This individual would oversee and manage all aspects of the EMS program while working with the EMS Advisory Commission. All aspects of the EMS program include, but are not limited to budgeting, purchasing, monitoring contract compliance, etc. Additionally, this individual should serve as the quality improvement (QI) and education coordinator.

Human Resources

Recommendation #13: *Contract with the fire departments wishing to participate in the new system to provide human resources for staffing and maintaining operation of transport ambulances.*

Within the Town of Enfield there exists a significant amount of human resources, statically and geographically distributed structures which are more than suitable for staffing and operating this recommended EMS system. Additionally, there exists a strong interest and enthusiasm among members of these fire departments to become more involved in this aspect of the EMS system.

In order to accomplish this mission, there needs to be congruence among the fire departments on how to accomplish this contractual service. For example, the system can operate efficiently at current call and transport levels with a maximum of three BLS transport vehicles, but there are four fire departments wishing to participate in any new system which is implemented. The possible solution to this dilemma is a rotation of the third ambulance among the third and fourth slowest call load fire departments with the two busiest fire departments maintaining 24-hour, 7 day a week BLS ambulance operation.

Under this scenario, assuming the mentioned fire departments wish to participate in the new system, the two 24-hour ambulances would be based at Thompsonville and Enfield fire departments, while the third ambulance would be rotated between Hazardville and North Thompsonville fire departments.

These fire departments will need to hire additional career personnel in order to meet their performance standards. The financial aspects of these additional personnel and providing funding through the Public Consortium will be discussed in a later section.

Fire departments are traditionally ideal to provide emergency medical service. The extremely low turnover rate among career fire fighters means that the personnel responding to an emergency are far more likely to have a higher skill level in emergency medical and trauma response because of tenure.

The fire service in the United States has an extensive history and background with the delivery of emergency medical service. The first paramedic systems in the country developed in the late 1960's and 70's. These paramedic systems were operated by fire departments in the such cities as Seattle, Columbus (OH), Baltimore, Jacksonville, Miami, and Los Angeles County. Ironically, these systems were operational well before the signing of the 1973 EMS Act which established federal funding for EMS systems.

An independent EMS trade journal in a 1996 survey of the EMS market determined that the fire service comprised 45.3 percent of all transporting agencies. The next closest category of transporting agencies was non-fire based volunteer squads at 17 percent. Clearly, the fire service is the predominant provider of EMS transport services in the country.

Another factor which makes the fire service excellent for providing EMS transport is the issue of public trust. A 1998 survey done by *USA Today* questioned “Who do you trust the most?” The number one ranked answered was the “fire department” with 77 percent.

Economies of scale can also be achieved with the fire service because of the Fair Labor Standard Act. Under the FLSA, a firefighter can work a 53 work week before overtime must be paid. Under the 207(k) exemption, only firefighters and police officers qualify for these exemption. Additionally, firefighters are multi-tasked. Besides doing EMS transport, they also provide fire suppression, educational services, fire inspection, fire prevention, vehicle rescue, plus a myriad of other services. Single role EMS providers merely provide one service - patient care and transport.

If the Town of Enfield were to have the fire service provide transport, the ability to effectively fight fire or effect a rescue in a burning building would increase dramatically as a result of increased manpower and staffing to a fire response.

Finally, the new system would also promote the retention of experienced personnel since personnel in the fire service traditionally make the fire service a career.

- Another problem typically encountered with the labor force is failing to involve the rank and file in any planning. Again, this is not true in the Town of Enfield since the fire departments have developed several EMS committees to explore the issue of emergency medical service delivery.

- According to the results of an Emergency Care Information Center (ECIC) survey, cross-trained/dual role personnel have a lower clinical error rate than single-role EMS providers. Data from the study showed fire fighter/EMS providers had an average error rate of 0.99 in a six month period, while the error rate for single-role EMS providers was 1.69. [3]

- The fire departments will need to hire full-time fire fighters in order to fulfill the contractual requirements with the Enfield EMS Public Consortium.

- The fire protection departments should conform to state and federal guidelines with respect to recruitment, selection, hiring, and retention of people in protected classifications.

Communications

Connecticut Public Act 00-151, An Act Concerning EMS Data Collection and EMD, requires data must be

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[3] Cady G, Page J, Scott T, “A Comparison of Occupational Stress Differences Between Fire Department Dual Role, Cross-Trained EMS Providers and Single-Role Providers”, ECIC JEMS Communications, Carlsbad, CA

electronically submitted to Office of State-wide Emergency Telecommunication (OSET). The first quarter for which a communication center must provide data starts January 1, 2001 through March 31, 2001.

Recommendation #14: *Ensure compliance with Connecticut Public Act and submit data to OSET each quarter beginning with data generated January 1, 2001.*

In the future, certification as an EMD will be required. The Connecticut General Assembly has passed Public Act 00-151, An Act Concerning EMS Data Collection and EMD. In essence, all telecommunicators should be trained up to the Department of Transportation, National Highway Traffic and Safety Administration standards by July 1, 2004.

However, for the EMS system in Enfield to become effective with a "chain of survival," and to improve the current system, all telecommunicators in the police communications center need to be EMD certified and follow established standards when screening emergency medical 911 telephone calls.

Recommendation #15:: *Ensure compliance with Connecticut Public Act and certify all telecommunicators as Emergency Medical Dispatchers according to standards established by the National Highway Traffic and Safety Administration.* However, this objective should be accomplished much earlier that the July 1, 2004 deadline.

Recommendation #16: *Develop Quality Assurance (QA) program to ensure compliance of the EMD program with the telecommunicators.*

To ensure the efficacy of the EMD program, and to ensure the proper resources are being dispatched to a medical emergency, it will be necessary to develop a QA program. It is recommended that initially a total of 10% of all medical calls be evaluated for compliance with whatever EMD system is implemented. Feedback should be provided to those telecommunicators as to their compliance under the EMD protocols.

Recommendation #17: *In keeping with the critical objectives of the EMS Agenda for the Future, it is recommended that 9-1-1 be promoted as the number to call for anyone in the Town of Enfield in need of emergency medical assistance.*

Future technologies and federal law will allow public safety agencies to determine the exact location of anyone calling for assistance from a wireless device. The Enfield Police Department needs to ensure their future technologies will interface with this principle.

Transportation

Recommendation #18: *The EMS system in Enfield should operate three BLS ambulances from 0800 - 2400 and two BLS ambulances from 2400 - 0800 , while maintaining their current agreement with American Medical Response for advanced life support services until Phase II becomes operational.*

Based upon data which determined the UH:U and call distribution by time, the appropriate number of ambulances during these times is three during peak periods and two during non-peak periods.

The Town of Enfield should begin transport on all BLS EMS calls. The recommended number of ambulances is three. Based upon 2000 data of 3,680 calls, the annual call volume will be approximately 10 calls per day, system wide. Obviously, not all 3,680 calls were BLS calls.

- The goal should be BLS first response in four minutes (<4:59) or less with 90% reliability. The ALS ambulance response should be in eight minutes (<8:59) or less with 90% reliability. These numbers are easily obtained based upon geographic coverage and run volume.

- Ambulances should be deployed at existing engine houses.

- Hospital destination guidelines or protocols should be developed that provide prehosptial providers with guidance about the varying needs of customers and hospital capabilities.

For the period of December 1, 1999 - November 30, 2000, the following graph reflects call distribution by fire district. Aggregate numbers on graph do not match year 2000 totals because of several calls which occurred on borderline between two different fire districts.

Finances

- The financial feasibility of EMS transport in the Town of Enfield is addressed in a supplemental section.

- Any “high-cost” start up costs should be accomplished through lease-purchase arrangements. For example, any new ambulances should be accomplished through a three year lease-purchase arrangement.

Performance Improvement (PI)/Data Management

Recommendation #19 : *Develop a Quality Improvement program covering communications, first response, and EMS transport, while also utilizing QI data from Johnson Memorial Hospital.*

The EMS Director with Johnson Memorial Hospital, through the QI program in place at the hospital, should continue to evaluate run information and provide feedback to the EMS Director of the Town of Enfield.

Under the new system, the Town of Enfield should mandate the development and implementation of clinical Performance Improvement data collection, analysis, and feedback processes that are consistent across all of the providers in the system. The Performance Improvement system should be educational in nature, not punitive, and should have improvement of patient care as the ultimate goal.

A system must be in place to perform Performance Improvement activities relative to system operational performance. The system must include the following characteristics:

- Identification of quality indicators
- Confidentiality
- Due Process
- Defined responses to deviations from accepted standards.

Newer technologies are now available to the market which allow care providers to electronically enter patient data information into pen-based computers or laptop computers.

Recommendation #20: *Ensure proper complete, accurate, and comprehensive documentation of patient treatment on each and every call. Become compliant with the Health Insurance Portability and Accountability Act of 1996 by required dates.*

Proper and complete documentation of patient assessment and treatment is an absolute necessity to enhance patient treatment for care providers in the hospital setting, to reduce liability or possible litigation at a later date, and to ensure maximum revenue for billing purposes. This documentation also includes obtaining the proper signatures from patients, guardians, witnesses to refusals of care, and hospital personnel receiving a patient.

The U.S. Department of Health and Human Services published a new rule designed to protect the privacy of health-care information in the December 28, 2000, *Federal Register*. This complex rule requires written permission from patients before their information can be released - even for treatment or billing purposes.

The ruling applies to electronic, written, and oral formats. Known as the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the intent is to streamline the processing of healthcare claims, and at the same time, protect patient privacy rights as the healthcare and insurance industries gradually shift from paper to electronic claims processing. HIPAA compliance is not required until two years after the regulation takes effect. The Enfield EMS system must be compliant with the standardization portion of the regulation, which covers claims and code sets, by October 2002. Compliancy must be obtained with the privacy and security portion of the regulation by February 2003.

Medical Accountability

Recommendation #21: *Continue to utilize and strengthen the relationship with Johnson Memorial Hospital as Medical Control.*

Johnson Memorial Hospital, although some distance from the Town of Enfield is committed to the community as a whole.

The Enfield Community EMS system will need to work closely with Johnson Memorial Hospital especially in preparation for Phase II with respect to State of Connecticut regulations 19a-179-12.

In the near future, Johnson Memorial Hospital will embark on a program to upgrade those communities which they sponsor and serve to the ALS level. Johnson Memorial Hospital in the future plans on working with such communities as Somers to upgrade their BLS systems to ALS.

This Johnson Memorial Hospital upgrade system in the future should create the catalyst for the Town of Enfield to create their ALS system in Phase II.

Public/Customer Service

Recommendation #22: *Provide a forum and process for public input into the EMS system.*
Public input is particularly crucial in arriving at system standards such as response times, cost benefits analysis, level of care, performance improvement, etc. It is recommended no less than 10 percent of those patients transported be sent a customer satisfaction survey in order to determine if the citizen's expectations are being met.

EMS Education

Recommendation #23: *Develop initial and continuing education programs to provide appropriate educational opportunities for all system personnel. These programs would involve both initial and continuing education requirements.*

The EMS Director, in consultation with the Johnson Memorial Hospital Medical Director, should develop an outline and work towards compliance which ensure proper continuing education hours for all providers in the system to improve performance and in order to comply with state standards for relicensure.

The education system will need to be articulated with the performance improvement and data management so that the PI system output can be plugged back into the educational process.

Provide a clear and specific mechanism to ensure participation by the Johnson Memorial Hospital Medical Director in the educational process.

The fire departments who participate in the system should maintain accurate and comprehensive record keeping with respect to continuing education in order to maintain documentation and proper licensure on all persons working as care providers.

Public Information, Education, and Resources (PIER)

Recommendation # 24: *Develop and expand PIER programs to decrease mortality and morbidity in the community*.

PIER programs will likely be much more effective if they are coordinated by the EMS Director through the public safety agencies and care providers in the community. .

Programs aimed at the public should promote the cooperative nature of the system. Some programs to consider include:

- "Welcome to the Neighborhood" program
- First aid classes
- Adult/infant CPR classes (Routine schedule or scheduled to accommodate large groups)
- Quarterly newsletter
- Safety inspection programs
- Baby sitting classes
- Block parties
- Firehouse Chats
- Disaster planning for schools (coordinated with Enfield Police Department)
- Drinking, driving, drugs presentations at area high schools
- Safety helmet sales
- Car seat checks
- Motor vehicle safety
- Safety jamborees in conjunction with local fire and police departments
- Seat belt checks

- Public presentations to senior citizens

Whenever a transition occurs and one service assumes the responsibility of transport from another service, especially in Phase II of this report, there should be a public information campaign informing the citizens of the change. In the case of the Town of Enfield assuming the transportation duties from American Medical Response in Phase II, a public information campaign should be established informing the citizens of the Town of the change. This public information campaign should meet several objectives:

u Urge anyone having a medical life-threatening emergency to continue calling 911.

u Emphasize the new and increased service levels as a result of the change.

u That there will be a reimbursement fee to the user charged for transport services rendered.

The goal of any emergency medical service system is to decrease mortality and morbidity within their response area. With the development of a PIER program within the new EMS system, the Town of Enfield should continue to have regularly scheduled cardiopulmonary resuscitation courses offered to their citizenry on an on-going basis. With the hiring of new personnel, consideration should be given to those applicants which are currently certified CPR instructors through the American Heart Association or the American Red Cross.

CHAPTER VII SERVICE COMPARISON

Component	**Current System**	**Proposed Public Consortium Model**
Management	No structured, integrated management structure in place between police, fire and private ambulance service.	Oversight Board setting direction, policy with system overseen by EMS Director overseeing all aspects of delivery care; lines of accountability with supervision
Human Resources	Full-time police officers, with some career and volunteer fire fighters providing working in various capacities of first response and EMS transport. In consistencies with manning of “chase” cars.	Full committed workforce with police handling first response and fire department providing dedicated paid personnel for provision of treatment and transport. Traditional fire agencies have little or no turnover rate unless there is termination from service, retirement or injury.

Communications & Response Times	Communications provided by Enfield Police - EMD consistently First response <4 minutes	EMD provided consistently with pre-arrival instructions. <4 minutes average BLS response anticipated with 95% reliability
Transportation	Unable to determine amount of ambulances available 24 hours a day to Town of Enfield	Phase I - Maximum of 3 BLS ambulances available with ALS by AMR and significant mutual aid component from surrounding communities. Phase II - ALS provided by dedicated workforce in community.
Financial	No funding dedicated by Town of Enfield. Inconsistencies with fee for service, and Town dependent upon civic organization.	Consistency of fee for service; revenue generated to operate system. No confusion of paid versus “free ambulance.”

Operations	Inconsistency with response matrix.	Consistency of response matrix. Continuity of care between first responders and EMS transport. Continuity of equipment, training, SOPs, administration, etc.
Performance Improvement	Performance Improvement through Johnson Memorial Hospital	Development of a clinical Performance Improvement data collection, analysis, and feedback process system impacting BLS and ALS delivery. PI impacting operational component.
Medical Accountability	Medical Director actively involved in system.	Medical Director actively involved; Position on oversight board by Hospital.
EMS Education	Education provided by various resources.	Strong education component in place for providers involved in BLS and ALS through in-house and outside programs.
Customer Service	No customer service program in place.	Customer service satisfaction specific to EMS needs
Public Information Education Relation	No identifiable programs.	Injury prevention and educational programs in place, coordinated through EMS program in Town of Enfield.

CHAPTER VIII Financial Feasibility of EMS Transport in the Town of Enfield

One of the primary concerns with the operation of any EMS transport system is the financial stability and feasibility. The proposed transport program is designed to operate with a cost-recovery component under all operational scenarios. In order for the EMS transport component of the Town of Enfield to be economically efficient, it will be necessary to bill for transport services.

Recommendation#25: *Seek reimbursement for all transport services from federal, state, third party providers, and private individuals.*

This makes economical and practical sense. By billing for transport services, the cost of the service is passed back to the user of the service. Additionally, most citizens have already paid for insurance coverage in the event ambulance transport is required. This is done either in the form of federal taxes or insurance premiums through their employer.

The question of financial efficiency is directly related to the program's information gathering and analysis capability and the continued support of administrative and the oversight board members. If the conditions described in other parts of the report are met, the Town of Enfield will have the tools and capability to operate a technically sophisticated and financially efficient emergency ambulance transport program.

It cannot be stressed enough - Proper documentation by field providers is essential to the financial stability of the transport program.

The new EMS Director should ensure that all field providers who transport a patient to the hospital are being as detailed and accurate as possible when completing a patient report. Many reimbursement agencies, whether it is a Medicare agency, the State, or a private insurance company will refuse payment based upon "medical necessity." Many claims are rejected because of the lack of documentation supporting the "medical necessity" of the transport.

Additionally, the new EMS Director needs to develop a method in order to reconcile that all transports are actually being billed for reimbursement. Failure to bill a patient which has been transported will result in lost revenue.

Other factors which will impact finance is the time necessary to transition to full operational status. First is the design of the organizational structure. This includes job descriptions, lines of communication, and performance criteria. The first position filled should be that of the EMS Director. This person must be an experienced EMS executive with strong leadership skills and a comprehensive understanding of the changing and dynamic environment. This person will also need to act as a quality manager and educator. This person will establish the internal controls and external scanning techniques of the organization. At the same time, a medical director needs to be incorporated into the management team. Under State of Connecticut regulations, an EMS transport program is required to have a sponsor hospital.

Once the department begins transporting patients, it will take an additional three to six months to establish a reliable cash flow. This assumes complete billing information is collected for all patients by field personnel and an experienced medical billing service is used to process claims. Since there will be startup costs, operating expenses, and continued operations before a reliable cash flow is established, it will be necessary for the Town of Enfield to fund the initial startup and operation of the system.

Recommendation#26: *The Town of Enfield will need to create an enterprise fund or some other form of dedicated funding for initial startup costs, initial operations, and on-going operations. All future reimbursements should be directed to this fund for operating purposes.*

There are four primary sources of payment. Medicare, Medicaid, third party insurance, and private payment. Medicare is the federally funded medical insurance program for the elderly. Medicaid is the federally funded, state-administered medical insurance program for the poor and the disabled. Third party insurance is private insurance, including all fee-for-service and health maintenance organization (HMO) coverage plans. Private payment is that portion of the patient population which pays for medical care with personal funds.

In the Town of Enfield, based upon data collected in the United States Census Bureau statistics, the age of patients transported by the Enfield Community Ambulance, and other information, the payer mix is estimated to be:

Medicare	38 percent
Medicaid	13 percent
3rd Party	42 percent
Private Pay	7 percent

The gross revenue projection amount is the product of the number of transports multiplied by the "base" rate, plus additional charges, such as mileage. However, ambulance services that bill for transport services rarely collect the entire amount billed. Therefore, this preliminary figure is modified by different factors resulting in the subtotals and the totals in the "Estimated Reimbursement." To completely calculate the revenue amount for each category, both the "Total Transports" and the "base" rate have to be modified to reflect billing and reimbursement requirements.

In the near future, under Negotiated Rule Making agreements, the Health Care Finance Administration which is the agency which oversees the Medicare reimbursement program for ambulance providers will implement a new ambulance fee schedule. This is expected to take place on July 1, 2001.

Under current and future federal laws, reimbursement is not available for rendering service without transport. Under the Medicaid system, this social medical insurance for the poor and disabled pays a fixed amount, but is usually much lower than the base or even Medicare prices for ambulance service. Again, patient transportation is the key component for reimbursement.

Traditional medical insurance generally pays most (an average of 90%), but sometimes not all of the billed amount for ambulance transportation. Insurance payers, in effect, receive a discount off the base ambulance transport bill. Finally, it is estimated that some patients in the Town will pay an ambulance bill completely from personal funds.

This portion of the patient population is most sensitive to price changes. As the amount of the bill increases, the ability and willingness to pay decreases.

Revenue estimates do not include co-payments, deductibles, additional goods or services (e.g. disposable supplies), or special assignments (e.g. dry runs, false alarms, patient refusals, etc.) These amounts are generally the responsibility of the patient and therefore subject to the same perceptions that effect private-pay bills. In order to present the most conservative revenue projection, these billed amounts are not included in the projections because they may not be reimbursed by third-party payers and are subject to bad debt and delayed payment.

Additionally, under the new Medicare reimbursement rules, ambulance services will be required to accept "assignment" for Medicare reimbursement. In essence, whatever Medicare reimburses to the provider, the provider must accept and cannot seek the balance from the patient. Medicare will accomplish this through a phased-in percentage basis over the next several years.

In some cases involving private insurance, the difference between the amount of the ambulance transportation bill and the amount reimbursed by the various players is the responsibility of the patient. This difference may be referred to as a deductible and/or co-payment. A deductible is a first-dollar payment (usually a fixed amount) made by the patient before insurance coverage is applied to the amount owed. A co-payment is a proportional amount of the total due that is the responsibility of the patient. It is possible for a patient to be responsible for both a deductible and a co-payment.

For example, if the total ambulance bill is $100, and an insurance payer requires a $10 deductible and a 20% co-payment, the patient pays $10 as the deductible and 20% of the remaining $90. Twenty percent of $90 is $18, so the patient is responsible for the $10 deductible and the $18 co-payment for a total out-of-pocket payment of $28. The insurance payer submits the remaining $72.

With this system, some innovative EMS agencies have created subscription programs which covers the co-payment which the patient must pay. This ambulance membership program is a fix-price pre-payment of all or part of fee-for-service ambulance service bills for a certain period of time. Subscription programs, which is a type of secondary insurance, provides additional revenue for the fire service program, as well as providing financial relief for the patient, no matter how many times they utilize the service. Some successful fire-based subscription programs can be found in Springfield, Oregon and Shreveport, Louisiana. Ambulance membership programs work best in systems where:

- There is price sensitivity to ambulance rates
- The ambulance service is perceived as a high-quality provider
- The ambulance service has adequate name recognition
- The membership service area has the proper demographics
- There is a positive perceived value to risk relationship

There are some legal issues which surround ambulance membership programs. Those include whether a program of this type is permissible in the State of Connecticut. If not, enabling legislation may have to be passed. There are other issues involving Medicare and Medicaid.

A 1991 Medicare Fraud Alert warned about ambulance subscription programs that charge members insufficient premiums then do not bill Medicare co-payments. “These programs are not based on actuarial risk, but instead are a sham used to disguise the routine waiver of co-payments and deductibles,” the Fraud Alert said.

The Health Care Finance Administration clarified that it is necessary to determine whether the amounts charged as “premiums” by the ambulance companies are a reasonable approximation of the amounts than an average beneficiary would expect to pay for Medicare co-payments and deductibles over the period covered by the subscription agreement.

Additionally, the Town of Enfield should be aware that additional revenue sources do exist. For example, some fire departments bill auto insurance companies for auto extrication procedures.

The John Maciolek American Legion Post 154

What cannot be ignored is the financial benefits of having the John Maciolek American Legion Post 154 involved in any future EMS system in the Town of Enfield. This is unprecedented with the delivery of emergency medical service care in other communities.

The John Maciolek American Legion Post 154 has actively been involved in the start up and the maintenance of the system since 1950. This relationship between the John Maciolek American Legion Post 154 and any future EMS system in Enfield should continue. Not only should the relationship continue with a member of the Maciolek Post on the oversight committee, but the funding which has been an important component of the EMS system should continue with increased emphasis.

Gradually and eventually, that emphasis should shift toward the endowment fund which the Maciolek Post has established for future funding of the system. The membership is to be commended for their effort over the past 50 years to maintain an ambulance program in the community. The reality is that membership within the Post continues to age with no younger members joining. Within this scenario, the funding which is used for today's funding of the EMS system will not be available in the future and should not be depended upon for the system recommended in this report. However, with a concentrated effort toward establishing the endowment fund, the Maciolek Post and their membership would be able to secure a position of recognition, legacy, and testament to their contribution to the community over the past 50 years.

Recommendation #27: *Develop a strategic plan to help the Maciolek Post to establish a $1 million endowment fund.*

The Maciolek Post membership has expressed the desire to establish a $1 million endowment fund, which based upon a 10% return on investment (ROI) each year, would create $100,000 to help fund the operation. This funding could be directed towards capital expenditures (ambulances, AEDs) for the system.

In order to establish a $1 million endowment fund it will be necessary to develop a formalized and professional process for raising the balance from what has been currently raised. This may include hiring a professional firm specializing in fund raising activities.

Revenue Recovery

There are two options for billing. The first option is to use in-house billing services with the department actually billing payers or patients directly. Historically, in-house billing systems have had poor returns on reimbursement. In-house systems that report rates above 60% have adequate personnel trained and dedicated to conduct EMS billing. The lack of success in collection of billables is not a reflection on the department or its EMS operations, rather it indicates a lack of expertise in billing for services rendered.

Public Consortium Models billing systems with adequate collection rates have the following components in place:

Ø An effective and efficient patient information gathering system

Ø A portion of the staff dedicated to billing/collection tasks

Ø Staff with current knowledge in the third party payer rules, regulations, and requirements.

The second option for billing is to contract with a specialized billing company. The contracted billing agent takes on the responsibility for the entire billing system, including follow up. The Public Consortium remains responsible for gathering the initial patient data. Services can be contracted for a portion of the collected amounts. Most billing agency rates are negotiated based on the amount charged for EMS service and the call volume and type.

Three fee structures are common to the EMS billing industry.

Ø Flat Fee for Service

Ø Percentage Fee of Collectibles

Ø Contract Fee

Recommendation #28: *For the purposes of billing for service in the Town of Enfield, it is recommended that the billing process be "outsourced" to a professional firm specializing in ambulance reimbursement on a percentage fee of collectible basis.*

Chief Earl Provencher of the North Thompsonville Fire Department conducted a survey of communities surrounding Enfield and their revenue recovery process. During his discovery process he found those communities (Somers, Suffield, East Granby, East Windsor, Windsor Locks) use Ms. Lisa Shelanskas of Suffield, Connecticut. Ms. Shelanskas indicated, with the exception of East Windsor, the base rate for those communities is; BLS is $290, $8.50 per loaded mile, plus $57 for a shift differential for night calls. East Windsor runs an ALS service and charges $317 for BLS, $358 for ALS intercept services, and $455 for ALS transport. The collection rate for those communities range as low as 75 - 80% for one community, while the other range from 92 - 98% collection.

Additionally, Chief Provencher spoke with fire officials from Longmeadow, Massachusetts. Longmeadow uses COMSTAR from Ipswtich, Massachusetts for their collections. Longmeadow charges $343.94 for BLS, $408.43 for ALS-1, and $591.92 for ALS-2. Additionally, Longmeadow officials indicated they have a 90 - 95% collection rate.

Town of Enfield Two Year Estimated EMS Program Costs

	Year 2001	**Year 2002**
EMS Director[1](includes benefits)	$69,615	$71,357

Contract with FDs 15 FF positions (includes benefits)[2]	\$768,000	\$791,040
1 Ambulance (3 year lease purchase estimated)	\$35,000	\$35,000
AEDs (7)	\$18,000	\$5,000
Durable Medical Equipment	\$15,000	\$10,000
Expendable Medical Supplies	\$30,000	\$32,000
Insurance[3]	\$15,000	\$15,000
Totals	\$950,615	\$959,397

Costs associated with offices, building, heat, electricity, etc., if any, are not included in these figures.

[1] EMS Director salary commensurate with SEIU Supervisor collective bargain agreement, Step 1 salary for a Grade 11 position, effective July 1, 2001;

[2] 15 Firefighter positions to staff ambulances. Salary based on averages of two current union contracts with fringe benefits totaling a starting salary of \$51,200 for year 2001 with a 3% annual increase in year 2002. A total of 15 positions is estimated based upon current staffing standards for a 42 hour work week for a total unit hour deployment of 448 hours, allowing for vacations, sick leave, injury leave, etc.

[3] Insurance rate reflects current industry standard for a three ambulance BLS operation operating approximately 2,100 runs per year.

All costs are estimated costs based upon available information and national standards for an EMS system operating 2,100 BLS transports per year.

Estimated Revenue Projection from Public Consortium EMS Transport System

The following revenue is based upon 2,100 BLS transports per year, assuming a \$292 base rate for Medicare, private insurance, and private pay. It also takes into consideration a \$113.65 base rate for Medicaid. Estimated revenue also assumes \$8.50 per loaded patient mile, and \$1.77 per loaded mile for Medicaid, \$5.00 per loaded mile for Medicare, averaging 12 miles to a hospital. An average of 12 miles to the hospital was used by calculating the center of town to the most prevalent receiving hospital - Johnson Memorial Hospital.

	Estimated % of Transports	Estimated Number of Transports	100% Estimated Reimbursement with Mileage	80% Estimated Reimbursement with Mileage
Medicare	38	798	$280,896	$224,716.80
Medicaid	13	273	$36,824.97	$29,459.97
3rd Party Insurance	42	882	$347,508	$278,006.40
Private Pay	7	147	$57,918	$46,334.40
Total	100%	2,100	$723,146.97	$578,517.57
7% Collection Fee			$50,620.28	$40,496.22
Anticipated Revenues			**$672,526.68**	**$538,021.34**

**Please note

Additional funding may be obtained through various charges including oxygen, supplies, a night charge, etc. However, over the next four years, Medicare will gradually phase out these reimbursements from their payment schedule through a percentage reduction.

It is anticipated that most private insurance companies will adopt the Medicare guidelines for reimbursement over the next 3 - 5 years.

Financial Analysis Discussion

It is projected that there will be insufficient funding to make the EMS system in the Town of Enfield self-reliant with only reimbursement funding. This scenario may change later with economy of scale savings, additional revenue from ALS reimbursement, or the State of Connecticut allowing the Town of Enfield to adjust their reimbursement rates.

In the interim, additional funding for the system will have to come from the Town of Enfield and/or the fire departments. This funding would be sufficiently reduced once the John Maciolek Post $1 million endowment fund is achieved. At a 10% return on the endowment, an additional revenue funding of approximately $100,000 can be achieved which can be directed toward the purchase of ambulances or other capital equipment.

CHAPTER IX FINAL ISSUES

Liability

In any activity involving the potential for accidental death or injury, there is the potential for all parties who may have been in any way responsible for preventing or causing the death or injury to be charged with negligence in a civil action initiated by the injured party, parties, or their survivor(s). Charges of negligence may arise from:

- Failure to render an obligated service
- Failure to recognize a life involvement (either in general or to a specific person) during an emergency
- Administering improper medical treatment
- Vehicle accidents caused by improper maintenance of department vehicles or inadequate driver training
- Failure to keep adequate records

Research into the claims experience of two large EMS systems found that claims occurred approximately once every 25,000 patient contacts and that the average claim was approximately $15,000 dollars. [4,5]

The Town of Enfield will need to procure insurance for the purposes of insuring new vehicles, EMS equipment, general liability, and medical malpractice. It is estimated this annual premium will be $15,000.00.

Closing Remarks

There is a great need to restructure the delivery of emergency medical care within the Town of Enfield. During the course of conducting research for this project, several providers had made comments that they knew personally of cases where patient care was not optimized, not because of the care providers, but because of system design.

It is concluded that if all or most of the recommendations put forth in this document are followed, there is tremendous opportunity for improvement. A massive amount of advancement is possible by placing the delivery of emergency medical service care and transport under the auspices of the Town of Enfield. With the placement of emergency medical service care and transport under the police and fire departments, there can be more cohesive coordination between the three main components - dispatch, first response, and transport. Under the three main components, there would be consistency with management, training, equipment, human resources, standard operating guidelines, patient continuity, rules and regulations, and patient care delivery.

Appendix A

The following are a compilation of the recommendations contained within the Enfield report. These

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\4 Soler JM, Montes MF, Egol AB, et al: "The 10-Year Malpractice Experience of a Large Urban EMS System." *Annals of Emergency Medicine,* 14:982-985, 1985.

5 Goldberg RJ, Zautcke JL, Koenigsberg MD, et al: "A Review of Prehospital Care Litigation in a Large Metropolitan EMS System." Annals of Emergency Medicine. 19:557-561, 1990.

recommendations are listed as to the order of importance or priority as opined by the Consultant.

Recommendation #1: *Key to the opportunity to improve the delivery of emergency medical care in the Town of Enfield should be the transition of the system to a public consortium EMS model. This public consortium EMS model should develop in two phases. Phase I would consist of initially providing basic life support transport, while preparing in Phase II to transition to delivering advanced life support services and transport.*

Recommendation #10: *Prior to proceeding with the implementation of a public consortium EMS system, the Town of Enfield should seek legal counsel to review the State of Connecticut, Department of Health, Emergency Medical Service Connecticut Statutes and the Town Charter. It is also recommended that legal counsel be used to review any regulations enacted by OEMS with respect to the Emergency Medical Service Connecticut Statutes prior to implementation.*

Recommendation#6: *Implementation of this system should occur as soon as possible in order to reduce morbidity and mortality in the Town of Enfield.*

Recommendation#26: *The Town of Enfield will need to create an enterprise fund or some other form of dedicated funding for initial startup costs, initial operations, and on-going operations. All future reimbursements should be directed to this fund for operating purposes*.

Recommendation #11: *Create an EMS Advisory Commission.*

Recommendation #2: *The Town Council should appoint an EMS Advisory Commission which would provide recommendations, help to establish policy, and provide direction for the provision of emergency medical services throughout the entire Town of Enfield. The establishment of an EMS Advisory Commission should be done in a manner consistent with Connecticut state laws and the Town Charter.*

Recommendation #3: *The EMS Advisory Commission should be a seven member group consisting of a town official, a council member, the police chief, a member of the Enfield Fire Chief's Association, a representative of Johnson Memorial Hospital, a representative from the John Maciolek American Legion Post 154, and a citizen in the community familiar with EMS systems.*

Recommendation #12: *Create a position of EMS Director*.

Recommendation #4: *A full-time EMS Director should be hired to manage the day-to-day operations, administration, logistics, and coordination of the six public safety agencies and one private ambulance company with respect to the EMS system. The EMS Director would be a Town of Enfield employee.*

Recommendation #13: *Contract with the fire departments wishing to participate in the new system to provide human resources for staffing and maintaining operation of transport ambulances.*

Recommendation #5: *The public consortium EMS model in Enfield should enter into financial and performance contracts with the various fire departments to provide the human resources to deliver emergency medical care, using the equipment, ambulances, and supplies provided by and owned by the public consortium EMS model. The contracts entered into with the fire departments should stipulate certain criteria, such as manning of vehicles, times of deployment, response times, etc.*

Recommendation#7: *Preparation for Phase II should begin as soon as possible, outlining time tables for various components or cooperating with Johnson Memorial Hospital when a paramedic program* *is initiated by the hospital.. This is especially true if the fire departments within the Town plan on training in-house personnel as paramedics. The fire departments should give priority to volunteer personnel already familiar with the system. However, as a "fail-safe," consideration may have to be given to hiring individuals already licensed as paramedics in the State of Connecticut.*

Recommendation #18: *The EMS system in Enfield should operate three BLS ambulances from 0800 - 2400 and two BLS ambulances from 2400 - 0800 , while maintaining their current agreement with American Medical Response for advanced life support services until Phase II becomes operational.*

Recommendation #8: *Continue to have American Medical Response (AMR) provide advanced life support services for Town until Phase II operation begins.*

Recommendation #9: *Equip all Enfield police vehicles with appropriate basic life support equipment and an automatic external defibrillator (AEDs) while maintaining the current medical licensure of police officers at the EMT level.*

Recommendation#25: *Seek reimbursement for all transport services from federal, state, third party providers, and private individuals.*

Recommendation #28: *For the purposes of billing for service in the Town of Enfield, it is recommended that the billing process be "outsourced" to a professional firm specializing in ambulance reimbursement on a percentage fee of collectible basis.*

Recommendation #27: *Develop a strategic plan to help the Maciolek Post to establish a $1 million endowment fund.*

Recommendation #14: *Ensure compliance with Connecticut Public Act and submit data to OSET each quarter beginning with data generated January 1, 2001.*

Recommendation #17: *In keeping with the critical objectives of the EMS Agenda for the Future, it is recommended that 9-1-1 be promoted as the number to call for anyone in the Town of Enfield in need of emergency medical assistance.*

Recommendation #15:: *Ensure compliance with Connecticut Public Act and certify all telecommunicators as Emergency Medical Dispatchers according to standards established by the National Highway Traffic and Safety Administration.* However, this objective should be accomplished much earlier that the July 1, 2004 deadline.

Recommendation #16: *Develop Quality Assurance (QA) program to ensure compliance of the EMD program with the telecommunicators.*

Recommendation #19 : *Develop a Quality Improvement program covering communications, first response, and EMS transport, while also utilizing QI data from Johnson Memorial Hospital.*

Recommendation #21: *Continue to utilize and strengthen the relationship with Johnson Memorial Hospital as Medical Control.*

Recommendation #22: *Provide a forum and process for public input into the EMS system.*

Recommendation #23: *Develop initial and continuing education programs to provide appropriate* *educational opportunities for all system personnel. These programs would involve both initial and continuing education requirements.*

Recommendation # 24: *Develop and expand PIER programs to decrease mortality and morbidity in the community.*

Recommendation #20: *Ensure proper complete, accurate, and comprehensive documentation of patient treatment on each and every call. Become compliant with the Health Insurance Portability and Accountability Act of 1996 by required dates.*